


77 Rec'd PCT/PTO 07 NOV 2001

FORM PTO-1390 (REV. 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER 7180
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (If known, see 37 CFR 1.5) <b>09/926461</b>
INTERNATIONAL APPLICATION NO. PCT/CA00/00565	INTERNATIONAL FILING DATE 8 MAY 2000	PRIORITY DATE CLAIMED 7 MAY 1999	
TITLE OF INVENTION EDIBLE CASING FILM FORMULATION			
APPLICANT(S) FOR DO/EO/US Reg MACQUARRIE; Kurt SCHUPP; and Peter TAYLOR			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
<ol style="list-style-type: none"> <li>1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li>2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li>3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.</li> <li>4. <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31).</li> <li>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> <li>a. <input checked="" type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau).</li> <li>b. <input type="checkbox"/> has been communicated by the International Bureau.</li> <li>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</li> </ol> </li> <li>6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)). <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> is attached hereto.</li> <li>b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4).</li> </ol> </li> <li>7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau).</li> <li>b. <input type="checkbox"/> have been communicated by the International Bureau.</li> <li>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</li> <li>d. <input type="checkbox"/> have not been made and will not be made.</li> </ol> </li> <li>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).</li> <li>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</li> <li>10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</li> </ol>			
Items 11 to 20 below concern document(s) or information included:			
<ol style="list-style-type: none"> <li>11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</li> <li>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</li> <li>13. <input checked="" type="checkbox"/> A FIRST preliminary amendment.</li> <li>14. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.</li> <li>15. <input type="checkbox"/> A substitute specification.</li> <li>16. <input type="checkbox"/> A change of power of attorney and/or address letter.</li> <li>17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.</li> <li>18. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4).</li> <li>19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).</li> <li>20. <input checked="" type="checkbox"/> Other items or information: <ol style="list-style-type: none"> <li>a. Small Entity Declaration.</li> </ol> </li> </ol>			

U.S. APPLICATION NO. (if known, see 37 CFR 1.5) <b>09/926461</b>		INTERNATIONAL APPLICATION NO. PCT/CA00/00565		ATTORNEY'S DOCKET NUMBER 7180	
21. <input checked="" type="checkbox"/> The following fees are submitted: <b>BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):</b> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO ..... <b>\$1000.00</b>  International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO ..... <b>\$860.00</b>  International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... <b>\$710.00</b>  International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... <b>\$690.00</b> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) ..... <b>\$100.00</b> <b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>				<b>CALCULATIONS PTO USE ONLY</b>	
				<b>\$890.00</b>	
				<b>\$</b>	
				<b>\$</b>	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				<b>\$</b>	
<b>CLAIMS</b>	<b>NUMBER FILED</b>	<b>NUMBER EXTRA</b>	<b>RATE</b>	<b>\$</b>	
Total claims	- 20 =		x \$18.00	<b>\$</b>	
Independent claims	- 3 =		x \$80.00	<b>\$</b>	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00	<b>\$</b>	
<b>TOTAL OF ABOVE CALCULATIONS =</b>				<b>\$890.00</b>	
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				<b>\$445.00</b>	
<b>SUBTOTAL =</b>				<b>\$445.00</b>	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				<b>\$</b>	
<b>TOTAL NATIONAL FEE =</b>				<b>\$445.00</b>	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				<b>\$</b>	
<b>TOTAL FEES ENCLOSED =</b>				<b>\$</b>	
				<b>Amount to be refunded:</b>	<b>\$</b>
				<b>charged:</b>	<b>\$</b>
a. <input checked="" type="checkbox"/> A check in the amount of <u>\$445.00</u> to cover the above fees is enclosed.  b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.  c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>19-2105</u> . A duplicate copy of this sheet is enclosed.  d. <input type="checkbox"/> Fees are to be charged to a credit card. <b>WARNING:</b> Information on this form may become public. <b>Credit card</b> <b>information should not be included on this form.</b> Provide credit card information and authorization on PTO-2038.					
<b>NOTE:</b> Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO:  SHLESINGER, ARKWRIGHT & GARVEY LLP 3000 S. EADS STREET ARLINGTON, VIRGINIA 22202					
 SIGNATURE MICHAEL M. ZADROZNY NAME 30-985 REGISTRATION NUMBER					

09/926461

Case 7180

PATENT COOPERATION TREATY  
UNITED STATES DESIGNATED/ELECTED OFFICE  
UNITED STATES PATENT AND TRADEMARK OFFICE

In re U.S. National Stage of :  
PCT Application No.: PCT/CA00/00565 :  
PCT Filing Date: 8 MAY 1999 :  
Inventor: Reg MACQUARRIE et al. :  
For: EDIBLE CASING FILM FORMULATION :

PRELIMINARY AMENDMENT

Honorable Commissioner of Patents and  
and Trademarks  
Box PCT  
Washington, D.C. 20231

Dear Sir:

Preliminary to calculation of the fees, amend the above-  
identified application as follows:

IN THE CLAIMS:

Rewrite claims 4, 5, 6, 7 and 8 as follows.

4. (amended) A liquid composition according to claim 1  
and further comprising up to 15% of a protein selected  
from the group consisting of gelatin, soya protein  
concentrate, soya protein isolate, whey protein  
concentrate, albumin, vegetable protein, collagen and  
collagen hydrolysates.

5.(amended) A liquid composition according to claim 1 and further comprising up to 25 wt.% of a plasticizing polyhydric alcohol other than glycerol.

6.(amended) A liquid composition according to claim 1 and further comprising up to 5 wt.% of sodium citrate.

7.(amended) A liquid composition according to claim 1 and further comprising up to 2 wt.% of a salt selected from the group consisting of calcium chloride, potassium chloride and potassium carbonate.

8.(amended) An edible casing film prepared by forming and drying a film from a liquid composition according to claim 1 and wherein the proportion of Konjak gum an/or Gellan gum relative to the carrageenan present in said liquid composition has been selected such that the film produced does not disintegrate in water at a temperature in the range of from 70°C to 100°C.

PCT Application No.: PCT/CA00/00565

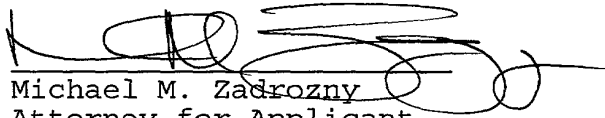
- 3 -

REMARKS

The above amendments to the claims 4, 5, 6, 7 and 8 are for purposes of removing multiple dependencies. A marked up version of the amended claims is attached as required under 37 CFR 1.121.

Respectfully submitted,

Date: NOV. 7, 2001

  
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TELETYPE

Marked up version required under 37 CFR 1.121

4. (amended) A liquid composition according to [ any one of claims 1 to 3, ] claim 1 and further comprising up to 15% of a protein selected from the group consisting of gelatin, soya protein concentrate, soya protein isolate, whey protein concentrate, albumin, vegetable protein, collagen and collagen hydrolysates.

5. (amended) A liquid composition according to [ any one of claims 1 to 4 ] claim 1 and further comprising up to 25 wt.% of a plasticizing polyhydric alcohol other than glycerol.

6. (amended) A liquid composition according to [ any one of claims 1 to 4 ] claim 1 and further comprising up to 5 wt.% of sodium citrate.

7. (amended) A liquid composition according to [ any one of claims 1 to 4 ] claim 1 and further comprising up to 2 wt.% of a salt selected from the group consisting of calcium chloride, potassium chloride and potassium carbonate.

8. (amended) An edible casing film prepared by forming and drying a film from a liquid composition according to [ any one of claims 1 to 7 ] claim 1 and wherein the proportion of Konjak gum an/or Gellan gum relative to the carrageenan present in said liquid composition has been selected such that the film produced does not disintegrate in water at a temperature in the range of from 70°C to 100°C.

09,926461

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PCT/CA00/00565

EDIBLE CASING FILM FORMULATIONBackground of the Invention

For a number of years, edible films have been used to replace membranes and casings made of animal viscera, in the production of smoked meat products such as ham and sausages. Currently available edible films include collagen films, modified cellulose films and carrageenan-based films.

Collagen films are composed of edible collagen, plasticized with glycerol or other polyols. They are manufactured by extrusion onto a belt followed by drying to remove the moisture. The collagen slurry is applied to the belt cold, and requires high-temperature drying to remove all the excess moisture and bring the film to a final moisture content of approximately 10%. Apart from the difficulty in processing films of this kind, these materials can bring about allergic reactions in certain consumers. Too, being derived from the coum layer of beef or pork, collagen may be an unacceptable casing or film material for religious and dietary reasons.

Modified cellulose films are for the most part composed of modified hydroxypropyl methylcellulose. To date, almost all films of this kind which have been produced are cold water-soluble films which begin to disintegrate on contact with water. For this reason, they have not been used in meat processing.

Carrageenan is a polyanionic polysaccharide derived from red algae. The material is an excellent film-former and has been used in the formulation of edible food packaging films (U.S. Patent No. 4,851,394) and heat-sealable edible films (U.S. Patent No. 5,089,307 - Ninomiya et al.). Films composed primarily of carrageenan additionally exhibit excellent strength, are not soluble in cold water and bind well to meat

However, because carrageenan forms a thermoreversible gel, films composed of a predominant carrageenan proportion tend to disintegrate in hot water, i.e. above 70°C. The hot carrageenan aqueous solution then re-gels upon contact with cooler water, less than 50°C.

It was one of our objectives to develop carrageenan-based films which can effectively and economically replace edible collagen films currently utilized in ham and sausage production, while providing high yields and high-quality product.

Collagen film is typically wrapped around hams during production, for ease in netting removal after the ham has been cooked. Collagen films appear to the consumer to be part of the ham after cooking and, indeed, are usually not taken note of by the average consumer. Many styles of meats are processed using collagen films, including various ham, chicken and turkey products.

#### General Description and Objects of the Invention

It is an object of the present invention to provide polysaccharide films which would function well by satisfying all of the following key attributes:

- composed of food ingredients which meet Food Chemical Codex Specifications and are approved for usage, i.e. GRAS rated in the United States (generally regarded as safe).
- a film that would maintain its composition during the cooking cycle, until the ham forms its own natural protein skin.
- after cooking, film adheres to the finished product, in that it does not fully disintegrate after a prolonged exposure to hot water or steam.
- film is tender to eat following processing of the meat product.



-3-

- film binds to the meat surface during and subsequent to processing.
- film is permeable to flavouring smoke.
- film imparts an appealing shine and colour to the cooked product.

We have found that excellent properties for edible films can be achieved by including, along with the carrageenan, suitable non-thermoreversible gel-forming polymers, preferably Konjac and Gellan gums. Konjac is extracted from the konjac tuber. This polysaccharide hydrates immediately and can form either thermoreversible or non-thermoreversible gels, depending on the conditions under which the gel is formed. Gellan gum is a polysaccharide gum produced from bacterial fermentation. It is a strong gel former and produces gels that are non-thermoreversible in the presence of  $\text{Ca}^{+2}$  and other multivalent anions. Both Konjac and Gellan gums are edible and GRAS rated. We observed that Konjac tends to form gels having a higher degree of elasticity than Gellan, which forms gels having a more brittle texture.

According to present invention, edible films and casing materials comprise a polymer base of carrageenan/Konjac/Gellan, and also a suitable starch, alginate or other polysaccharide, depending on the specific attributes required.

Starch functions to reduce water absorption of the film and it is preferred that a high-amylose starch be used, as high-amylose starch is inherently a better film-former than other starches.

"Alginate" herein refers to the alginates which are commonly used in the food industry, namely polypropylene glycol alginate, sodium alginate or calcium alginate. Alginate in compositions according to the present

-4-

invention tend to produce strong films exhibiting good adhesion.

Specific methods and formulations are described in more detail below, but generally we have found the following compositions to provide useful edible films:

Component	Suggested Range	
	Low (wt.%)	High (wt.%)
Carrageenan	2	35
Gellan	0	35
Konjac	0	35
Locust bean gum (LBG)	0	10
Protein	0	15
Starch**	0	20
Alginate**	0	35
Sodium Citrate	1	5
Sorbitan Monostearate	0.25	3
Glycerol	1.0	35
Other Plasticizer <sup>†</sup>	0	25
Water	8	35

\*\* total of Gellan & Konjac gums should be no less than about 5 wt% and up to about 35 wt%

\* total of starch + alginate should be no less than about 5 wt% and up to about 35 wt%

† polyhydric alcohols, other than glycerol

The synergistic effects of the main polymers, Gellan Konjac and carrageenan, function to produce a film of high tensile strength, hot and cold water resistance and gum substrate adherence.

The use of a protein source is desirable to provide the film with both improved adhesion and shine functionality. The presence of some (at least about 5%) of alginatge or starch component is necessary to give sufficient film casing adhesion.

Other polysaccharides, as discussed below, may be added to impart specific desired properties to the film. Glycerol was added for its elasticizing effects.

-5-

Optionally, calcium chloride or potassium carbonate may be utilized to improve the film strength and hot water resistance.

From other formulations tested it is possible to significantly alter the relative amounts of each gel-forming polymer in the film to produce films exhibiting some varying degree of hot water solubility.

#### Detailed Description of the Invention

Polymer solutions were prepared for film casting as follows: glycerol or other plasticizers were added to the requisite amount of hot water. While maintaining the solution at an elevated temperature (80-90° C), then the dry ingredients were added and the solution vigorously mixed to homogeneity. The polymer solution was then continuously mixed under slow agitation for 1-2 hours to remove trapped air bubbles.

Once the polymer solution appeared to be smooth and free of lumps, it was cast into film, using either a casting box or with a standard draw down bar. Care must be taken to ensure that the hot solution is cast in a uniform thin layer. In all of the experimental examples given below, film was formed by drawing the solution down onto a hot (90°C) stainless steel belt with a Gardener dye. The films were either air dried overnight at room temperature, or dried over a hot water bath and then removed for testing.

Films produced this way would initially be tested for thickness using a micrometer (Gauge) and tensile/tear strength.

The methods for measuring tear strength and elongation are those specified in ASTM D638. Normally 5

-6-

specimens are tested from each of 5 samples with the following conditions

- 20lbf load cell
- Crosshead speed: 2 in./minute
- Die "C" cut specimens

Films that met these requirements would then be tested for hot water solubility by placing strips of the film in boiling water and then allowing the water to cool with the film sample in it. After cooling, the water would then be drained off and non-solubilized material would be placed with the drain dish in the drying oven. If the film was reconstituted after drying then the film was deemed to have maintained its structure during exposure to the hot water. If the film was not resistant to the water then it would become soluble and could be poured off. (Hence no film left after drying)

After a particular sample had been characterized as above, it would be subjected to the same process conditions under which commercial meats are produced. In particular the film would be wrapped around a particular meat substrate (turkey, ham, chicken) and then the wrapped meat sample dried in a convection oven until a protein skin could be seen forming on the sample. After this the sample was transferred into a steam cooker for the completion of cooking. The internal temperature of the meat sample would have to reach 70-80°C. After the completion of cooking, the sample was allowed to cool and the final product examined and results recorded. Samples were then packed away under vacuum for shelf-life testing.

Films according to the invention which we tested on meat film wrap were also produced using the following polysaccharides, supplementary to starch and/or alginate, with Gellan and/or Konjac: agar, modified starches, guar

gum, cellulose gum, modified cellulose gum, gum arabic, pullian and xanthate.

In some of the formulations, the following proteins were included: gelatin, soya protein concentrate, soya protein isolate, whey protein concentrate, albumin, miscellaneous vegetable proteins, collagen and collagen hydrolysates.

The following general observations arose from our experiments:

- (i) Either Gellan and/or Konjac is required for synergistic reaction with the carrageenan and other gums or polysaccharide to provide the desired hot water resistance. The proportion of Gellan and/or Konjac is that amount necessary to modify carrageenan sufficiently to ensure that the film will not disintegrate upon exposure to hot water. Films could be made out of Konjac or Gellan alone, but these would be far less economical than the combination with other polysaccharide and in any event would have inferior physical properties, e.g. poor film strength, susceptibility to hydration, etc.
- (ii) The presence of starch or alginate is essential in these compositions to impart proper adhesion at the final film in its intended use as food film and casing.
- (iii) Added protein is highly advantageous, to ensure proper adherence of the film to the meat after completion of cooking and for the aforementioned aesthetic purpose of mimicking the glossy appearance imparted by collagen.

The film compositions may also be modified by the addition of compounds for specific purposes, such as

1. anti-microbial;
2. release agents;
- 5 3. colourants (i.e. caramels, oleoresins and other synthetic or natural colourants - iron oxide);
4. flavors and spices.

With particular application to meat processing, black films can be produced using caramel, so that processors need no longer dip the meat products in a liquid caramel to obtain that colour.

#### Examples of Edible Film Formulations

##### Example 1

<u>Component</u>	<u>Parts</u>
Gellan	15
Locust bean gum	3
Kappa carrageenan	3
Konjac	8
Sodium citrate	3
20 Calcium chloride	2
Maltodextrin	10
Glycerol	25
Water	30

This film exhibited very high tensile strength (140 kg/cm<sup>2</sup>) and good elongation (30%). The film showed outstanding resistance to tear and had excellent handling properties. The film could be removed from a meat product after cooking very easily. (low adhesion)

##### Example 2

<u>Component</u>	<u>Parts</u>
Gellan	8
Kappa carrageenan	10

-9-

	Konjac	3
	Locust bean gum	2
	HVP	7
	High amylose starch	9
5	Sodium citrate	1
	Sorbitan monostearate	1
	Glycerol	25
	Polyethylene glycol	5
	Water	29

10 The film exhibited very high tensile strength (135-140 kg/cm<sup>2</sup>) and elongation (35%), and in particular showed excellent wet tensile strength. Again this film showed outstanding mechanical handling properties and on a meat product had very good adhesion.

### 15 Example 3

	<u>Component</u>	<u>Parts</u>
	Gellan	4
	Kappa carrageenan	7
	Konjac	2
20	Locust bean gum	1
	HVP	7
	High amylose starch	14
	Glycerol	32
	Caramel	4
25	Water	29

This film exhibited good tensile strength (110 kg/cm<sup>2</sup>) and elongation (35%) and because of the addition of caramel powder was black in colour. The film had good adhesion properties as well as excellent mechanical  
30 handling properties.

### Example 4

<u>Component</u>	<u>Parts</u>
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-10-

	Gellan	10
	Locust bean gum	5
	Kappa carrageenan	8
	Hydrolyzed collagen	10
5	Maltodextrin	7
	Propylene glycol alginate	2
	Silicon dioxide	6
	Sodium citrate	2
	Potassium chloride	2
10	Glycerol	30

This film exhibited moderate tensile strength (100 kg/cm<sup>2</sup>) and good elongation (25%) and utilized collagen to give the film reasonable adhesion to a meat product.

#### Example 5

15	<u>Component</u>	<u>Parts</u>
	Carrageenan	30
	Konjac	15
	Alginate	20
	Glycerol	25
20	Water	10

This film was completely clear and exhibited a very high tensile strength (200 kg/cm<sup>2</sup>) with and elongation of 40%. It showed very high adhesion and could not be removed from the meat product after cooking.

25 Finally, an unexpected advantageous property which we observed in films made according to the invention was efficient heat sealability at 180°C, suggesting usefulness of these films as a replacement for hydroxypropyl methyl cellulose films in casings and food  
30 pouches.

RIDOUT & MAYBEE  
Toronto, Canada

Patent Agents



CLAIMS

1. A liquid composition for casting into an edible film, comprising a uniform mixture of from 2 to 35 wt.% of carrageenan, from 5 to 35 wt.% of a gum selected from the group consisting of Gellan gum and Konjac gum, from 5 to 35 wt.% of a polysaccharide selected from the group consisting of starches and alginates or combinations thereof, from 1 to 35 wt.% of glycerol, and from 8 to 35 wt.% of water.

2. A liquid composition according to claim 1, wherein said polysaccharide comprises a high-amylose starch.

3. A liquid composition according to claim 1, further comprising up to 10 wt.% of locust bean gum.

4. A liquid composition according to any one of claims 1 to 3, further comprising up to 15% of a protein selected from the group consisting of gelatin, soya protein concentrate, soya protein isolate, whey protein concentrate, albumin, vegetable protein, collagen and collagen hydrolysates.

5. A liquid composition according to any one of claims 1 to 4, further comprising up to 25 wt.% of a plasticizing polyhydric alcohol other than glycerol.

6. A liquid composition according to any one of claims 1 to 4, further comprising up to 5 wt.% of sodium citrate.

7. A liquid composition according to any one of claims 1 to 4, further comprising up to 2 wt.% of a salt selected from the group consisting of calcium chloride, potassium chloride and potassium carbonate.

-12-

8. An edible casing film prepared by forming and drying a film from a liquid composition according to any one of claims 1 to 7, wherein the proportion of Konjak gum and/or Gellan gum relative to the carrageenan present in said liquid composition has been selected such that the film produced does not disintegrate in water at a temperature in the range of from 70°C to 100°C.
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T0401 = T513250

**DECLARATION AND POWER OF ATTORNEY - ORIGINAL APPLICATION**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below beneath my name:

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which Letters Patent is sought on the invention entitled

**EDIBLE CASING FILM FORMULATION**

the specification of which   X   is attached hereto  
(check one)            was filed on                                   
as Application S.N.                                   
and was amended on                                 

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by an amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International Application which designated at least one country other than the United States, listed below and have also identified below any foreign application for patent or invention certificate, or a PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)	Priority Claimed		
<u>2,271,361</u>	<u>Canada</u>	<u>7 May 1999</u>	<u>X</u>
(Number)	(Country)	(Day/Month/Year Filed)	YES NO
<u>                                </u>	<u>                                </u>	<u>                                </u>	<u>                                </u>
(Number)	(Country)	(Day/Month/Year Filed)	YES NO

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below:

(Application Ser. No.)

(Filing Date)

(Application Ser. No.)

(Filing Date)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s), or §365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

**PCT/CA00/00565**

**May 8, 2000**

**Pending**

(Application Ser. No.)

(Filing Date)

(Status)

(patented, pending, abandoned)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

B. Edward Shlesinger, Jr., Reg. No. 17,225; George A. Arkwright, Reg. No. 20,158; George A. Garvey, Reg. No. 17,737; Josefino P. de Leon, Reg. No. 33,166; Terrence L. B. Brown, Reg. No. 32,685; Michael M. Zadrozny, Reg. No. 30,985; and Brian J. Marton, Reg. Agent 30,292;

SEND CORRESPONDENCE TO: **SHLESINGER, ARKWRIGHT & GARVEY LLP**  
**3000 South Eads Street**  
**Arlington, Virginia 22202**

DIRECT TELEPHONE CALLS TO **Michael M. Zadrozny (703) 684-5600**

The undersigned hereby authorizes the U.S. attorney(s) or agent(s) named herein to accept and follow instructions from **Ridout & Maybee LLP** as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney(s) or agent(s) and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney(s) or agent(s) named herein will be so notified by the undersigned.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that the statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Full name of sole or first inventor Reg MACQUARRIE  
Inventor's signature *Reg MacQuarrie* Date Nov 04, 01  
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Full name of third or joint inventor Peter TAYLOR  
Inventor's signature *P Taylor* Date Nov 14<sup>th</sup> 2001  
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Applicant: Reg MACQUARRIE et al.Filed: HerewithFor: EDIBLE CASING FILM FORMULATION**VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS**  
**37 CFR 1.9(I) AND 1.27(b) - Independent Inventor**

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled **EDIBLE CASING FILM FORMULATION** described in the specification filed herewith.

I have not assigned, granted, conveyed, or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

I acknowledge the duty to file, in this application or patent, notification to any change in status resulting in loss of entitlement to small entity status prior to payment, or at the time of paying, the earliest of the issue fee or any maintenance fees due after the date on which status as a small entity is no longer appropriate (37 CFR 1.28(b)).

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that the statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

<u>Reg MACQUARRIE</u>	<u>Kurt SCHUPP</u>	<u>Peter TAYLOR</u>
Name of Inventor	Name of Inventor	Name of Inventor
<i>Reg MacQuarrie</i>	<i>Kurt Schupp</i>	<i>Peter Taylor</i>
Signature of Inv.	Signature of Inv.	Signature of Inv.
<i>NOV 4 / 2001</i>	<i>NOV 04. 2001</i>	<i>NOV 24 2001</i>
Date	Date	Date

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